PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 11 September 2000 (11.09.00)	
International application No. PCT/GB00/00149	**Applicant's or agent's file reference** RW/7052INT
International filing date (day/month/year) 20 January 2000 (20.01.00)	**Priority date** (day/month/year) 20 January 1999 (20.01.99)
Applicant BENNETT, Paul et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

14 August 2000 (14.08.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer R. Chrem
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

MARSHALL, John, Grahame
Serjeants
25 The Crescent
King Street
Leicester LE1 6RX
ROYAUME-UNI

Date of mailing (day/month/year)
11 September 2000 (11.09.00)

Applicant's or agent's file reference
RW/7052INT

IMPORTANT NOTIFICATION

International application No.
PCT/GB00/00149

International filing date (day/month/year)
20 January 2000 (20.01.00)

1. The following indications appeared on record concerning:

[ ] the applicant [ ] the inventor [X] the agent [ ] the common representative

Name and Address

SERJEANTS
25 The Crescent
King Street
Leicester LE1 6RX
United Kingdom

State of Nationality:
State of Residence:
Telephone No.: 44 116 233 2626
Facsimile No.: 44 116 233 0551
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[X] the person [ ] the name [ ] the address [ ] the nationality [ ] the residence

Name and Address

MARSHALL, John, Grahame
Serjeants
25 The Crescent
King Street
Leicester LE1 6RX
United Kingdom

State of Nationality:
State of Residence:
Telephone No.: 44 116 233 2626
Facsimile No.: 44 116 233 0551
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[X] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer
R. Chrem

Telephone No.: (41-22) 338.83.38

International Preliminary Examining Authority
European Patent Office
D-80298 München
Germany

09 August 2000

Our Ref: B014.013.00 GM/CB
Your Ref:

Dear Sirs,

PCT Application No. PCT/GB00/00149
Neopress Limited et al
Amendment Request under PCT Article 34

By this letter we request amendment under Article 34 PCT of pages 4 and 7-9 of the Description, and amendment of the Claims of this Application. Replacement pages are filed herewith, but the amendments are individually identified below. The reason for the amendment to the Description is that the figure numbers in the Description do not correspond to those in the drawings. The amendment to the Claims is to limit the scope of Claim 1 to that of former Claim 8. In the remainder of this letter, the page and line references refer to the PCT Application as originally filed.

Page 4, lines 12 & 13:	Amend to read "Fig. 3 is a diagrammatic side view of a bandage system comprising a bandage according to Figs. 1 and 2 surrounded by a second bandage, being a compression bandage, fitted onto a patient's leg;".
Page 4, line 14:	Amend "bandage" to "second bandage".
Page 4, line 16:	Amend "bandage" to "second bandage".
Page 4, line 19:	Amend "bandage" to "second bandage".
Page 4, line 21:	Amend to read "stitching up into the second bandage of Fig. 3."
Page 7, line 15:	Amend "Figs. 4 and 6" to "Figs. 4 and 7".
Page 7, line 22:	Amend "Fig. 6" to "Fig. 7".
Page 7, lines 24 & 25:	Delete the sentence commencing "Fig. 9 shows .....".
Page 7, line 27:	Amend "Fig. 8" to "Fig. 7".
Page 8, line 14:	Amend "Fig. 6" to "Fig. 3" and "Fig. 8" to "Fig. 6".
Page 8, lines 19 & 20:	Delete "as illustrated by the arrows in Fig. 8".
Page 8, lines 30:	Amend "Fig. 8" to "Fig. 5".
Page 9, line 1:	Amend "Fig. 6" to "Fig. 3".
Page 9, lines 25 to 29:	Delete the paragraph.
Claim 1, line 1:	Amend "bandage" to "bandage shaped to conform substantially to the whole of a lower leg of a patient,"
Claim 8:	Delete this claim and renumber all subsequent claims.

Former Claim 9, line 1: Amend "according to claim 8" to "according to any preceding claim".

Former Claim 9, line 2: Amend "lower leg and foot" to "whole of the lower leg and a foot".

Former Claim 10: Append to claim 8, and in line 2 amend "lower leg" to "whole of the lower leg".

Former Claim 11: Append to claim 9.

Former Claim 12: Append to claim 10.

Former Claim 14: Append to claim 12.

Former Claim 15: Append to claim 13.

Former Claim 16: Append to claim 13 or claim 14.

Former Claim 20: Append to claim 2.

Former Claim 21,line 4: Amend "a patient's limb" to "the patient's lower leg".

Former Claim 22: Append to claim 20.

Former Claim 23: Append to claim 21.

Former Claim 24: Append to claim 21 or claim 22.

Former Claim 25: Append to claim 23.

Former Claim 26: Append to claim 23 or claim 24.

Former Claim 27: Append to claim 25.

Former Claim 28: Append to "any of claims 20 to 26".

Former Claim 29: Append to claim 27.

Former Claims 30 to 32: Delete these claims.

Yours very truly,
SERJEANTS

Grahame Marshall
European patent representative

Encs:
Chapter II PCT Demand
PCT Fee Calculation Sheet
Replacement pages (x3)

to be arranged to indicate a gradation of pressure from one end of the bandage to the other.

The preferred embodiment of the bandage system has the advantage that it can replace all four layers of the system described in the introduction and is much simpler and faster to apply. Moreover, it is possible using the preferred embodiment to achieve the desired pressures simply and with accuracy.

At least one embodiment of the invention will now be described by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a plan view of a bandage;

Fig. 2 is a diagrammatic sectional view of a part of the bandage shown in Fig. 1, showing the laminations;

Fig. 3 is a diagrammatic side view of a bandage system comprising a bandage according to Figs. 1 and 2 surrounded by a second bandage, being a compression bandage, fitted onto a patient's leg;

Fig. 4 is a diagrammatic side view of the second bandage of Fig. 3, not fitted onto a patient's leg;

Fig. 5 is a diagrammatic perspective view of the second bandage of Fig. 3, wrapped around as if to be fitted onto a patient's leg;

Fig. 6 is a partial diagrammatic plan view, showing an upper part of the second bandage of Fig. 3, laid out flat in its unstretched state; and

Fig. 7 is a plan view of a flat piece of neoprene cut into a shape suitable for stitching up into the second bandage of Fig. 3.

Referring to Figs. 1 & 2, an absorbent bandage 10 is shown which is particularly suitable for venous leg ulcers, and which comprises a first or inner

The compression bandage 110 includes an upper part having a body 112 including a sheet of perforated neoprene. The perforations are not illustrated in the drawings, but are approximately 2mm in diameter, and 10mm apart. The perforations allow the leg to breathe, i.e. they allow moisture to leave a patient's leg through the bandage 110. An inner side (in use) of the neoprene is covered with a soft nylon lining, which is comfortable against a patient's leg. The nylon is bonded to the neoprene layer. An outer side (in use) of the neoprene is covered with a layer of cotton plush material, also bonded to the neoprene layer, the function of which is described in more detail hereinafter.

The body 112 is bounded by an upper edge 114. A lower edge 115 of the body is stitched to a foot portion 117, which is also made from perforated neoprene enclosed within inner and outer layers of nylon and plush cotton respectively.

The body 112 is made up of two shaped sheets of neoprene 150 and 152 (see Figs. 4 and 7). The sheets 150 and 152 are cut with curved edges 154 which are stitched together to form the body 112. This results in a body shape which fits snugly around a patient's leg, taking account of variations in leg diameter between the ankle and calf.

The foot portion 117 is made from a simple sheet of neoprene but small slits are cut from the neoprene and the resulting exposed edges 155 joined with stitching 156 to form an appropriately shaped foot portion.

Fig. 7 illustrates a flat piece of neoprene cut into a shape suitable for stitching into the bandage 110, showing the places where stitching occurs to form the shaped bandage.

The stitching on both the body 112 and foot portion 117 is omitted from Fig. 7 for the sake of clarity.

Extending between the upper and lower edges 114 and 115 of the body 112 are side edges 116A and 116B. The side edge 116A is substantially straight and the side edge 116B slightly scalloped. The foot portion 117B includes corresponding straight and scalloped side edges 119A and 119B respectively. Affixed to the side edges 116A are a plurality of attachments 122 consisting of rectangular tabs of material provided with VELCRO (trade mark) hooks on their inner sides. The attachment 122 are each approximately 50mm in width (along the length of the patient's leg in use) and 120mm in length (around the patient's leg in use) in their unstretched states. The attachments 122 are affixed to the body 112 by two rows of stitching 132, shown in Fig. 7 and on the uppermost attachment only in Fig. 6. The attachments 122 are made of stretchy nylon material.

The foot portion 117 is also provided with similar attachments 122 affixed to the side edge 199A and a narrower end attachment 123.

Fig. 3 shows the bandage system in place on a patient's leg and Fig. 6 illustrates diagrammatically the shape of the bandage 110 during application to the leg. To apply the bandage system, the laminated bandage 10 is first applied to the leg as described above. The compression bandage 110 is then applied over the bandage 10, as follows. The compression bandage 110 is wrapped around the leg and the edge 116A is pulled over the edge 116B such that the two overlap. The bandage is stretched around the leg, and the attachments 122 are laid onto the cotton plush material such that their hooks engage the material. In the stretched condition, the hooks open up slightly and engage the cotton plush material very firmly.

It is most important that the compression bandage 110 applies the correct pressure all along the leg from the top of the calf to the foot. The preferred pressure decreases gradually from about 35 to 40mmHg at the ankle to about 17 mmHg at the top of the calf. Rectangles 136 provided on the attachments 122 become square when the correct pressure is achieved. Such rectangles may be provided on all the attachments to ensure that the correct pressure is applied along the entire leg. It may be seen that the rectangles 136 of Fig. 5 become square in

Fig. 3 when the correct pressure is applied by the bandage to the leg.

Because the attachments 122 are provided essentially along the whole length of the compression bandage 110, gradually varying pressure is exerted along the patient's leg. No lines of high or low pressure are established if the bandage is used correctly.

It will be appreciated that in certain circumstances the absorbent bandage could be used in situations other than for the treatment of venous leg ulcers. In such cases, the use of the compression bandage would not be required. Further if the absorbent bandage is used to treat wounds other than on the leg, its configuration would be different.

Various modifications may be made to the above invention while still falling within its scope. The body of the compression bandage 12 need not be manufactured from neoprene but may be made from any suitable stretchy material, for example material incorporating rubber or elastane. The attachments need not incorporate hook or hook and fleece fastenings but may include tapes, cords or other similar materials attached together by hooks, loops, buckles or similar devices. The rectangle 136 may be replaced with any means for indicating the extent to which the body has stretched. For example, any shape may be printed onto the body. A plurality of such shapes may be used, for example, one adjacent to each projection to ensure an even pressure is exerted throughout the entire bandage. The bandage may be designed to be used at a single optimum pressure or it may be provided with different indications to provide different pressures depending on the circumstances. For example three adjacent rectangles could become square at respectively different pressures.

Claims

1. A bandage shaped to conform substantially to the whole of a lower leg of a patient, comprising a first absorbent layer for arrangement adjacent the skin of a patient, and a second absorbent layer on the first absorbent layer, the second absorbent layer having a greater propensity for absorption of fluids than the first absorbent layer, whereby when the bandage is arranged over a wound of a patient, the first absorbent layer can absorb fluid from the wound and the second absorbent layer can absorb said fluid from the first absorbent layer.

2. A bandage according to claim 1 further including a third layer on the second absorbent layer on the opposite side thereof to the first absorbent layer.

3. A bandage according to claim 2 wherein the third layer is an absorbent layer and has a lower propensity for absorption than the second layer.

4. A bandage according to claim 2 or claim 3 wherein the third layer is permeable to vapour, thereby allowing the skin to breathe.

5. A bandage according to any of claims 2 to 4 wherein the third layer has substantially the same absorbency as, or less absorbency than, the first absorbent layer.

6. A bandage according to claim 5 wherein the third layer is formed of the same material as the first absorbent layer.

7. A bandage according to any of claims 2, 3 or 4 wherein the third layer is substantially impermeable to liquid but permeable to vapour.

8. A bandage according to any preceding claim, wherein the bandage is shaped to conform to the whole of the lower leg and a foot of the patient.

9. A bandage according to claim 8 including a first part shaped to conform to the whole of the lower leg of the patient and a second part shaped to conform to the foot of the patient.

10. A bandage according to claim 9 wherein the bandage has stitching along the region thereof conforming to the calf region of the leg, and stitching along the region conforming to the heel region of the foot.

11. A bandage according to claim 10 further including stitching in a region conforming to the toe region of the foot.

12. A bandage according to any preceding claim wherein the bandage has opposite side edges wherein the side edges can be overlapped to a desired degree to fit the bandage to the patient's limb.

13. A bandage according to claim 12 wherein securing means are provided to secure the edge regions together.

14. A bandage according to claim 13 wherein the securing means is in the form of an adhesive tape.

15. A bandage according to claim 13 or claim 14 wherein suitable tabs and/or flaps are provided to ensure appropriate overlap.

16. A bandage according to any preceding claim wherein the first absorbent layer includes a polyester viscose material.

17. A bandage according to any preceding claim wherein the second absorbent layer includes a polyester felt, suitably an hydrophilic polyester felt.

18. A bandage according to any preceding claim wherein the second absorbent layer includes cotton wool.

19. A bandage according to claim 2 wherein the third layer comprises a polyester viscose material.

20. A bandage system comprising a first bandage according to any preceding claim and a second bandage being a compression bandage, the second bandage comprising a sheet of elastic material and means for releasably maintaining the sheet of elastic material in a stretched condition around the patient's lower leg.

21. A bandage system according to claim 20 wherein the second bandage is formed from a rubber or rubber-like material.

22. A bandage system according to claim 21 wherein the second bandage is formed from a synthetic rubber, for example neoprene.

23. A bandage system according to claim 21 or claim 22 wherein the means for maintaining the material around the patient's limb includes an outer attachment associated with a side edge region of the sheet, the outer attachment comprising a plurality of tabs provided along substantially the length of said side edge.

24. A bandage system according to claim 23 wherein the tabs are so provided along the length of said side edge that there are substantially no gaps between adjacent tabs when the bandage is correctly applied to a patient's limb.

25 A bandage system according to claim 23 or claim 24 wherein one part of a hook and fleece fastening means is provided on an inner face of each tab and the other of said hook and fleece fastenings is provided on the sheet.

26. A bandage system according to claim 25 wherein each tab is stretchable, whereby when the second bandage is applied to the limb of a patient, the degree of stretch of the sheet material and of the tabs determines the pressure applied to the limb at the respective tab.

27. A bandage system according to any of claims 20 to 26 wherein the second bandage includes visual indication means to indicate whether the correct pressure is applied to the limb by the bandage.

28. A bandage system according to claim 27 wherein the visual indication means comprises a shape applied to at least some of the tabs to indicate that the correct pressure is applied when the shape alters in a recognisable way.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
RW/7052INT		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB00/00149	20/01/2000	20/01/1999
International Patent Classification (IPC) or national classification and IPC A61F13/00		
Applicant NEOPRESS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 8 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
14/08/2000	18.10.2000
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Louter. P Telephone No. +49 89 2399 2063

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00149

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-3,5,6	as originally filed			
4,7-9	as received on	14/08/2000	with letter of	09/08/2000

Claims, No.:

1-28	as received on	14/08/2000	with letter of	09/08/2000

Drawings, sheets:

1/6-6/6	as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

MARSHALL, John Grahame
SERJEANTS
25 The Crescent
King Street
Leicester LE1 6RX
GRANDE BRETAGNE

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	18.10.2000
Applicant's or agent's file reference RW/7052INT	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB00/00149	20/01/2000	20/01/1999

Applicant
NEOPRESS LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Abadie, N Tel.+49 89 2399-2746

Form PCT/IPEA/416 (July 1992)

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Claims 1-28 meet the requirements of novelty, inventive step and industrial application according to Articles 33(2) to 33(4) PCT for the following reasons:

From US-A-4 820 293 (further referred to as D1) is known a bandage with two absorbent layers.

The problem starting from this document is to provide a bandage which is easy to apply, doesn't slide during wearing and is capable of effectively absorbing wound fluids.

This problem is especially solved by the bandage being shaped to conform substantially to the lower leg of a patient.

D1, US-A-4 360 015 and EP-A-0 478 011 disclose bandages which consist of flexible strips which can be wound around a portion of the body. The bandages are not shaped to conform to a lower leg. These documents do therefore not disclose or make obvious a bandage according to claim 1.

The only bandage being shaped to conform to a lower leg is disclosed in DE-A-4 419 287. This document is concerned with a pressure bandage for human legs. This bandage does not include absorbent layers and is not intended to be used for wound treatment; it would therefore also not be obvious to apply absorbent layers to this pressure bandage. The bandage according to claim 1 is therefore not disclosed or made obvious by this document.

The bandages of EP-A-0 597 749 and DE-A-3 640 979 are not shaped to conform to a lower leg nor do they include absorbent layers.

The subject-matter of claim 1 is therefore new and does involve an inventive step.

The subject-matter of claim 1 is able to work, can be manufactured and is thus

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-28
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-28
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-28
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

looked upon as being industrially applicable.

2. Dependent claims 2-28 define further variations of the device according to claim 1 and thus equally meet the requirements of novelty, inventive step and industrial application according to Articles 33(2) to 33(4) PCT.

Re Item VII
Certain defects in the international application

1. No unambiguous basis for the feature of claim 1 that the bandage conforms to the whole of the lower leg could be found. The amendments filed with the letter dated 09.08.2000 therefore introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT.

2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 and DE-A-4 419 287 is not mentioned in the description, nor are these documents identified therein.

Re Item VIII
Certain observations on the international application

1. The statement in the description on page 2, 1st paragraph implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3a).

to be arranged to indicate a gradation of pressure from one end of the bandage to the other.

The preferred embodiment of the bandage system has the advantage that it can replace all four layers of the system described in the introduction and is much simpler and faster to apply. Moreover, it is possible using the preferred embodiment to achieve the desired pressures simply and with accuracy.

At least one embodiment of the invention will now be described by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a plan view of a bandage;

Fig. 2 is a diagrammatic sectional view of a part of the bandage shown in Fig. 1, showing the laminations;

Fig. 3 is a diagrammatic side view of a bandage system comprising a bandage according to Figs. 1 and 2 surrounded by a second bandage, being a compression bandage, fitted onto a patient's leg;

Fig. 4 is a diagrammatic side view of the second bandage of Fig. 3, not fitted onto a patient's leg;

Fig. 5 is a diagrammatic perspective view of the second bandage of Fig. 3, wrapped around as if to be fitted onto a patient's leg;

Fig. 6 is a partial diagrammatic plan view, showing an upper part of the second bandage of Fig. 3, laid out flat in its unstretched state; and

Fig. 7 is a plan view of a flat piece of neoprene cut into a shape suitable for stitching up into the second bandage of Fig. 3.

Referring to Figs. 1 & 2, an absorbent bandage 10 is shown which is particularly suitable for venous leg ulcers, and which comprises a first or inner

The compression bandage 110 includes an upper part having a body 112 including a sheet of perforated neoprene. The perforations are not illustrated in the drawings, but are approximately 2mm in diameter, and 10mm apart. The perforations allow the leg to breathe, i.e. they allow moisture to leave a patient's leg through the bandage 110. An inner side (in use) of the neoprene is covered with a soft nylon lining, which is comfortable against a patient's leg. The nylon is bonded to the neoprene layer. An outer side (in use) of the neoprene is covered with a layer of cotton plush material, also bonded to the neoprene layer, the function of which is described in more detail hereinafter.

The body 112 is bounded by an upper edge 114. A lower edge 115 of the body is stitched to a foot portion 117, which is also made from perforated neoprene enclosed within inner and outer layers of nylon and plush cotton respectively.

The body 112 is made up of two shaped sheets of neoprene 150 and 152 (see Figs. 4 and 7). The sheets 150 and 152 are cut with curved edges 154 which are stitched together to form the body 112. This results in a body shape which fits snugly around a patient's leg, taking account of variations in leg diameter between the ankle and calf.

The foot portion 117 is made from a simple sheet of neoprene but small slits are cut from the neoprene and the resulting exposed edges 155 joined with stitching 156 to form an appropriately shaped foot portion.

Fig. 7 illustrates a flat piece of neoprene cut into a shape suitable for stitching into the bandage 110, showing the places where stitching occurs to form the shaped bandage.

The stitching on both the body 112 and foot portion 117 is omitted from Fig. 7 for the sake of clarity.

AMENDED SHEET

Extending between the upper and lower edges 114 and 115 of the body 112 are side edges 116A and 116B. The side edge 116A is substantially straight and the side edge 116B slightly scalloped. The foot portion 117B includes corresponding straight and scalloped side edges 119A and 119B respectively. Affixed to the side edges 116A are a plurality of attachments 122 consisting of rectangular tabs of material provided with VELCRO (trade mark) hooks on their inner sides. The attachment 122 are each approximately 50mm in width (along the length of the patient's leg in use) and 120mm in length (around the patient's leg in use) in their unstretched states. The attachments 122 are affixed to the body 112 by two rows of stitching 132, shown in Fig. 7 and on the uppermost attachment only in Fig. 6. The attachments 122 are made of stretchy nylon material.

The foot portion 117 is also provided with similar attachments 122 affixed to the side edge 199A and a narrower end attachment 123.

Fig. 3 shows the bandage system in place on a patient's leg and Fig. 6 illustrates diagrammatically the shape of the bandage 110 during application to the leg. To apply the bandage system, the laminated bandage 10 is first applied to the leg as described above. The compression bandage 110 is then applied over the bandage 10, as follows. The compression bandage 110 is wrapped around the leg and the edge 116A is pulled over the edge 116B such that the two overlap. The bandage is stretched around the leg, and the attachments 122 are laid onto the cotton plush material such that their hooks engage the material. In the stretched condition, the hooks open up slightly and engage the cotton plush material very firmly.

It is most important that the compression bandage 110 applies the correct pressure all along the leg from the top of the calf to the foot. The preferred pressure decreases gradually from about 35 to 40mmHg at the ankle to about 17 mmHg at the top of the calf. Rectangles 136 provided on the attachments 122 become square when the correct pressure is achieved. Such rectangles may be provided on all the attachments to ensure that the correct pressure is applied along the entire leg. It may be seen that the rectangles 136 of Fig. 5 become square in

Fig. 3 when the correct pressure is applied by the bandage to the leg.

Because the attachments 122 are provided essentially along the whole length of the compression bandage 110, gradually varying pressure is exerted along the patient's leg. No lines of high or low pressure are established if the bandage is used correctly.

It will be appreciated that in certain circumstances the absorbent bandage could be used in situations other than for the treatment of venous leg ulcers. In such cases, the use of the compression bandage would not be required. Further if the absorbent bandage is used to treat wounds other than on the leg, its configuration would be different.

Various modifications may be made to the above invention while still falling within its scope. The body of the compression bandage 12 need not be manufactured from neoprene but may be made from any suitable stretchy material, for example material incorporating rubber or elastane. The attachments need not incorporate hook or hook and fleece fastenings but may include tapes, cords or other similar materials attached together by hooks, loops, buckles or similar devices. The rectangle 136 may be replaced with any means for indicating the extent to which the body has stretched. For example, any shape may be printed onto the body. A plurality of such shapes may be used, for example, one adjacent to each projection to ensure an even pressure is exerted throughout the entire bandage. The bandage may be designed to be used at a single optimum pressure or it may be provided with different indications to provide different pressures depending on the circumstances. For example three adjacent rectangles could become square at respectively different pressures.

Claims

1. A bandage shaped to conform substantially to the whole of a lower leg of a patient, comprising a first absorbent layer for arrangement adjacent the skin of a patient, and a second absorbent layer on the first absorbent layer, the second absorbent layer having a greater propensity for absorption of fluids than the first absorbent layer, whereby when the bandage is arranged over a wound of a patient, the first absorbent layer can absorb fluid from the wound and the second absorbent layer can absorb said fluid from the first absorbent layer.

2. A bandage according to claim 1 further including a third layer on the second absorbent layer on the opposite side thereof to the first absorbent layer.

3. A bandage according to claim 2 wherein the third layer is an absorbent layer and has a lower propensity for absorption than the second layer.

4. A bandage according to claim 2 or claim 3 wherein the third layer is permeable to vapour, thereby allowing the skin to breathe.

5. A bandage according to any of claims 2 to 4 wherein the third layer has substantially the same absorbency as, or less absorbency than, the first absorbent layer.

6. A bandage according to claim 5 wherein the third layer is formed of the same material as the first absorbent layer.

7. A bandage according to any of claims 2, 3 or 4 wherein the third layer is substantially impermeable to liquid but permeable to vapour.

8. A bandage according to any preceding claim, wherein the bandage is shaped to conform to the whole of the lower leg and a foot of the patient.

9. A bandage according to claim 8 including a first part shaped to conform to the whole of the lower leg of the patient and a second part shaped to conform to the foot of the patient.

10. A bandage according to claim 9 wherein the bandage has stitching along the region thereof conforming to the calf region of the leg, and stitching along the region conforming to the heel region of the foot.

11. A bandage according to claim 10 further including stitching in a region conforming to the toe region of the foot.

12. A bandage according to any preceding claim wherein the bandage has opposite side edges wherein the side edges can be overlapped to a desired degree to fit the bandage to the patient's limb.

13. A bandage according to claim 12 wherein securing means are provided to secure the edge regions together.

14. A bandage according to claim 13 wherein the securing means is in the form of an adhesive tape.

15. A bandage according to claim 13 or claim 14 wherein suitable tabs and/or flaps are provided to ensure appropriate overlap.

16. A bandage according to any preceding claim wherein the first absorbent layer includes a polyester viscose material.

17. A bandage according to any preceding claim wherein the second absorbent layer includes a polyester felt, suitably an hydrophilic polyester felt.

18. A bandage according to any preceding claim wherein the second absorbent layer includes cotton wool.

19. A bandage according to claim 2 wherein the third layer comprises a polyester viscose material.

20. A bandage system comprising a first bandage according to any preceding claim and a second bandage being a compression bandage, the second bandage comprising a sheet of elastic material and means for releasably maintaining the sheet of elastic material in a stretched condition around the patient's lower leg.

21. A bandage system according to claim 20 wherein the second bandage is formed from a rubber or rubber-like material.

22. A bandage system according to claim 21 wherein the second bandage is formed from a synthetic rubber, for example neoprene.

23. A bandage system according to claim 21 or claim 22 wherein the means for maintaining the material around the patient's limb includes an outer attachment associated with a side edge region of the sheet, the outer attachment comprising a plurality of tabs provided along substantially the length of said side edge.

24. A bandage system according to claim 23 wherein the tabs are so provided along the length of said side edge that there are substantially no gaps between adjacent tabs when the bandage is correctly applied to a patient's limb.

25 A bandage system according to claim 23 or claim 24 wherein one part of a hook and fleece fastening means is provided on an inner face of each tab and the other of said hook and fleece fastenings is provided on the sheet.

26. A bandage system according to claim 25 wherein each tab is stretchable, whereby when the second bandage is applied to the limb of a patient, the degree of stretch of the sheet material and of the tabs determines the pressure applied to the limb at the respective tab.

27. A bandage system according to any of claims 20 to 26 wherein the second bandage includes visual indication means to indicate whether the correct pressure is applied to the limb by the bandage.

28. A bandage system according to claim 27 wherein the visual indication means comprises a shape applied to at least some of the tabs to indicate that the correct pressure is applied when the shape alters in a recognisable way.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
RW/7052INT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GB 00/ 00149	20/01/2000	20/01/1999
Applicant		
NEOPRESS LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
GB 00/00149

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 4 820 293 A (KAMME CARL G) 11 April 1989 (1989-04-11) the whole document ---	1-10,13, 17-20 21-29
X	US 4 360 015 A (MAYER NATHAN) 23 November 1982 (1982-11-23) column 1, line 5 - line 8 column 3, line 37 -column 4, line 47; figure 1 ---	1-10,13, 17-20
X	EP 0 478 011 A (KIMBERLY CLARK CO) 1 April 1992 (1992-04-01) page 4, line 53 -page 5, line 57; figures 1-6 --- -/--	1-10,13, 17-20

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 May 2000	23/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Louter, P

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INTERNATIONAL SEARCH REPORT

International Application No
[redacted]GB 00/00149

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 44 19 287 A (HECHMAT ABOLGHASSEM DR MED) 21 December 1995 (1995-12-21) column 2, line 37 -column 3, line 17; figures 1,2	21-28
Y	EP 0 597 749 A (PRATICIEN LAB DU) 18 May 1994 (1994-05-18) abstract; figures 1-5	21,27-29
Y	DE 36 40 979 A (RAUSCHER & CO) 27 August 1987 (1987-08-27) figures 1,2	21,27-29

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
GB 00/00149

Patent document cited in search report		Publication date	Patent family member(s)			Publication date
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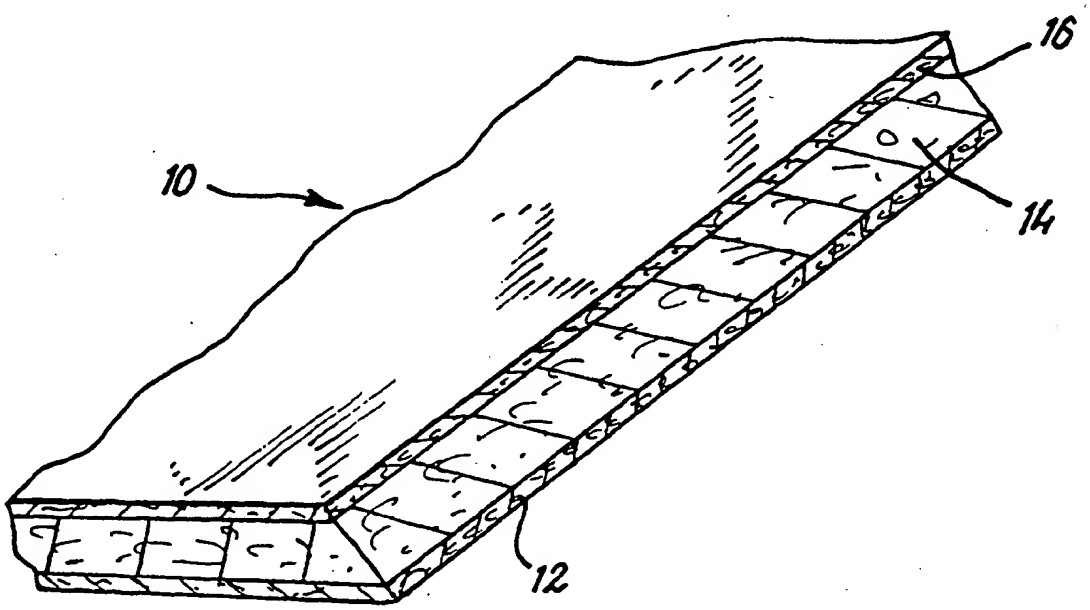

(57) Abstract

A bandage (10) includes a first absorbent layer (12) for arrangement adjacent the skin of a patient and a second absorbent layer (14) on the first absorbent layer (12), the second absorbent layer (14) having a greater propensity for the absorption of fluids than the first absorbent layer (12), whereby when the bandage (10) is arranged over a wound of a patient, the first absorbent layer can absorb fluid from the wound and the second absorbent layer can absorb said fluid from the first absorbent layer.

Bandage

This invention relates to bandages. More particularly, but not exclusively, the invention relates to laminated bandages, for example, such bandages for use in the treatment of venous leg ulcers. The invention also relates to bandage systems

The treatment of leg ulcers is traditionally carried out using a four piece bandage system which comprises a first layer of orthopaedic wool, a second layer consisting of a crepe bandage, a third layer consisting of a light pressure bandage, and fourth layer consisting of a cohesive bandage. The application of this system requires complex measurement of arterial pressures and upwards of half an hour to apply it. Moreover, it is difficult to ensure that the pressure applied by the bandage at various regions is correct.

According to one aspect of this invention there is provided a bandage comprising a first absorbent layer for arrangement adjacent the skin of a patient, and a second absorbent layer on the first absorbent layer, the second absorbent layer having a greater propensity for absorption of fluids than the first absorbent layer, whereby when the bandage is arranged over a wound of a patient, the first absorbent layer can absorb fluid from the wound and the second absorbent layer can absorb said fluid from the first absorbent layer.

The bandage advantageously further includes a third layer on the second absorbent layer on the opposite side thereof to the first absorbent layer, the third layer may be an absorbent layer and preferably has a lower propensity for absorption than the second layer.

In one embodiment, the third layer is permeable to vapour, thereby allowing the skin to breathe, and may have substantially the same absorbency as, or less absorbency than, the first absorbent layer. The third layer may be formed of the same material as the first absorbent layer. Alternatively, the third layer may be substantially impermeable to liquid but permeable to vapour.

The bandage may be shaped to conform substantially to a limb of the patient. In the preferred embodiment, the bandage is shaped to conform to the lower leg of the patient. The bandage may be shaped to conform to the foot of a patient or to the lower leg and foot of a patient. The bandage may have a first part shaped to conform to the lower leg of a patient and a second part shaped to conform to the foot of a patient.

The bandage may have stitching along the region thereof conforming to the calf region of the leg, and may have stitching along the region conforming to the heel region of the foot. Stitching may also be provided to conform to the two region of the foot.

The bandage may have opposite side edges wherein the side edges can be overlapped to a desired degree to fit the bandage to the patients' limb. Securing means may be provided to secure the edge regions together. The securing means is preferably in the form of an adhesive tape. Suitable tabs and/or flaps may also be provided to ensure appropriate overlap.

The first absorbent layer may comprise a polyester viscose material. The second absorbent layer may comprise a polyester felt, suitably an hydrophilic polyester felt. Alternatively, the second absorbent layer may comprise cotton wool. The third layer may be a polyester viscose material.

The preferred embodiment of the invention has the advantage that it can be used to replace the first two layers of the system described in the introduction.

According to another aspect of this invention there is provided a bandage system comprising a first bandage as described above and a second bandage being a compression bandage, the second bandage comprising a sheet of elastic material and means for releasably maintaining the sheet of elastic material in a stretched condition around a patient's limb. Thus, the first bandage is intended to be applied over the skin of the patient's limb, and the second bandage is intended to be applied over the first bandage.

Preferably, the second bandage is formed from a rubber or rubber-like material, and may be formed a synthetic rubber, for example neoprene.

The means for maintaining the material around the patient's limb may include an outer attachment associated with a side edge region of the sheet. Preferably, the outer attachment comprises a plurality of tabs provided along substantially the length of said side edge. The tabs are preferably so provided along the length of said side edge that there are substantially no gaps between adjacent tabs when the bandage is correctly applied to a patient's limb. One part of a hook and fleece fastening means may be provided on an inner face of each tab The other of said hook and fleece fastenings may be provided on the sheet. Preferably, the hook fastening is provided on each tab and the fleece fastening is provided on the sheet. In the preferred embodiment, the sheet comprises an outer layer formed of a plush material, said plush material constituting the fleece fastening. It will be appreciated that any other suitable fastening means may be provided on the tabs, for example a buckle or other suitable quick release device.

Each tab is preferably stretchable, whereby when the second bandage is applied to the limb of a patient, the degree of stretch of the sheet material and of the tabs determines the pressure applied to the limb at the respective tab.

Preferably, the second bandage includes visual indication means to indicate whether the correct pressure is applied to the limb by the bandage. The visual indication means is preferably adapted to indicate the extent to which the respective tab is stretched. Preferably, the visual indication means comprises a shape applied to at least some, and preferably each, of the tabs to indicate that the correct pressure is applied when the shape alters in a recognisable way. For example, the shapes may be in the form of an oblong, which alter to a square when the correct pressure is achieved.

The visual indication means may be so provided such that each indicates the same extent of stretch and correspondingly, the same pressure, or they may indicate different extents of stretch. For example, the visual indication means

may be so arranged to indicate a gradation of pressure from one end of the bandage to the other.

The preferred embodiment of the bandage system has the advantage that it can replace all four layers of the system described in the introduction and is much simpler and faster to apply. Moreover, it is possible using the preferred embodiment to achieve the desired pressures simply and with accuracy.

At least one embodiment of the invention will now be described by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a plan view of a bandage;

Fig. 2 is a diagrammatic sectional view of a part of the bandage shown in Fig. 1, showing the laminations;

Fig. 3 is a diagrammatic side view of a bandage according to a second embodiment of the invention, fitted onto a patient's leg;

Fig. 4 is a diagrammatic side view of the bandage of Fig. 3, not fitted onto a patient's leg;

Fig. 5 is a diagrammatic perspective view of the bandage of Fig. 3, wrapped around as if to be fitted onto a patient's leg;

Fig. 6 is a partial diagrammatic plan view, showing an upper part of the bandage of Fig. 3, laid out flat in its unstretched state; and

Fig. 7 is a plan view of a flat piece of neoprene cut into a shape suitable for stitching up into a bandage according to the second embodiment of the invention.

Referring to Figs. 1 and 2, an absorbent bandage 10 is shown which is particularly suitable for venous leg ulcers, and which comprises a first or inner

layer 12, a second or middle layer 14, and a third or outer layer 16 (see particularly Fig. 2). The inner layer 12 is formed of an absorbent material, for example a polyester viscose material. The outer layer 16 is also formed of an absorbent material, which may also be a polyester viscose material. The middle layer 14 is also formed of an absorbent material which has a greater propensity for absorption than the material from which the inner layer 12 is formed. In the embodiment shown, the material from which the middle layer 14 is formed is an hydrophilic polyester felt. Alternatively, the middle layer 14 may be formed from another absorbent material, for example, cotton wool.

Referring specifically to Fig. 1, the absorbent bandage 10 is formed of a shaped sheet of a particular configuration that is intended to conform to the lower leg and foot of a patient. In Fig. 1, the bandage is shown in a flat condition suitable for stitching into a bandage conforming as aforesaid to the shape of the lower leg and foot of a patient. The absorbent bandage 10 comprises a leg portion 18 which is adapted to fit around the lower leg of a patient, and a foot portion 20 which is adapted to fit around the foot of a patient. A heel portion 21 connects the leg portion 18 to the foot portion 20.

The leg portion 18 is formed of first and second sections 18A, 18B, which are each defined along one side by respective edges 19 intended to be stitched together along their length. The particular profiles of the edges 19 are selected to ensure that the first part 18 conforms closely to the shape of the lower leg of a patient.

For the sake of clarity, the use of dashed lines in the drawings adjacent an edge is intended to represent that the edge should be stitched to an adjacent corresponding edge.

A heel portion 21 is provided between the leg and foot portions 18, 20 and has edges 21A, 21B. It is intended that the edges 21A are stitched together, and the edges 21B are also stitched together. In this way, in the resulting bandage 10, the heel portion 21 conforms to the heel of the patient. Furtheredges to be stitched are represented at 22A and 22B in the foot portion

20. These enable the foot portion 20 to conform to the shape of the patient's foot.

It will be seen that the first section 18A of the leg portion 18 is somewhat larger than the section 18B. This ensures that there is sufficient material for overlap so that the bandage 10 can fit any size of leg. When the bandage 10 is applied to the patient's lower leg, the second section 18B is first wrapped around the patient's leg and the first section 18A is then wrapped over the second section 18B. If necessary, the first section 18A can be trimmed to the appropriate size. In this way, the leg portion 18 can be adjusted to fit around the patient's leg comfortably. Appropriate adhesive tape (not shown) can be used to attach the section 18A to the section 18B.

The foot portion 20 comprises first and second sections 20A, 20B. The first section 20A comprises a tab 26, and the second section 20B comprises an outwardly extending portion 28. It is intended that the second section 20B is first wrapped over the top of the patient's foot, and the first section 20A wrapped over the second section 20B. The portion 28 is provided to ensure that the bandage 10 fully covers the top of the foot. Appropriate adhesive tape (not shown) can then attach the first section 20A to the second section 20B.

The first section 18A also comprises a lower portion 25. When the bandage is fitted to a patient's foot, lower portion 25 overlies the foot and the tab 26 overlaps the lower portion 25. The tab 26 is attached thereto by appropriate adhesive tape (not shown).

When the bandage has been fitted to the patient, it fits snugly around the patient's lower limb and foot, covering the venous ulcer to absorb any liquid secreted from the wound. No pressure is applied to the leg by the bandage 10.

Figs. 3 to 7 illustrate a compression bandage 110 for use with the laminated bandage 10 to form a bandage system.

The compression bandage 110 includes an upper part having a body 112

including a sheet of perforated neoprene. The perforations are not illustrated in the drawings, but are approximately 2mm in diameter, and 10mm apart. The perforations allow the leg to breathe, i.e. they allow moisture to leave a patient's leg through the bandage 110. An inner side (in use) of the neoprene is covered with a soft nylon lining, which is comfortable against a patient's leg. The nylon is bonded to the neoprene layer. An outer side (in use) of the neoprene is covered with a layer of cotton plush material, also bonded to the neoprene layer, the function of which is described in more detail hereinafter.

The body 112 is bounded by an upper edge 114. A lower edge 115 of the body is stitched to a foot portion 117, which is also made from perforated neoprene enclosed within inner and outer layers of nylon and plush cotton respectively.

The body 112 is made up of two shaped sheets of neoprene 150 and 152 (see Figs. 4 and 6). The sheets 150 and 152 are cut with curved edges 154 which are stitched together to form the body 112. This results in a body shape which fits snugly around a patient's leg, taking account of variations in leg diameter between the ankle and calf.

The foot portion 117 is made from a simple sheet of neoprene but small slits are cut from the neoprene and the resulting exposed edges 155 joined with stitching 156 to form an appropriately shaped foot portion.

Fig. 6 illustrates a flat piece of neoprene cut into a shape suitable for stitching into the bandage 110, showing the places where stitching occurs to form the shaped bandage. Fig. 9 shows the body 112 and foot portions 117 joined but they may be formed from separate sheets of material.

The stitching on both the body 112 and foot portion 117 is omitted from Fig. 8, for the sake of clarity.

Extending between the upper and lower edges 114 and 115 of the body 112 are side edges 116A and 116B. The side edge 116A is substantially straight

and the side edge 116B slightly scalloped. The foot portion 117B includes corresponding straight and scalloped side edges 119A and 119B respectively. Affixed to the side edges 116A are a plurality of attachments 122 consisting of rectangular tabs of material provided with VELCRO (trade mark) hooks on their inner sides. The attachment 122 are each approximately 50mm in width (along the length of the patient's leg in use) and 120mm in length (around the patient's leg in use) in their unstretched states. The attachments 122 are affixed to the body 112 by two rows of stitching 132, shown in Fig. 7 and on the uppermost attachment only in Fig. 6. The attachments 122 are made of stretchy nylon material.

The foot portion 117 is also provided with similar attachments 122 affixed to the side edge 199A and a narrower end attachment 123.

Fig. 6 shows the bandage system in place on a patient's leg and Fig. 8 illustrates diagrammatically the shape of the bandage 110 during application to the leg. To apply the bandage system, the laminated bandage 10 is first applied to the leg as described above. The compression bandage 110 is then applied over the bandage 10, as follows. The compression bandage 110 is wrapped around the leg and the edge 116A is pulled over the edge 116B such that the two overlap as illustrated by the arrows in Fig. 8. The bandage is stretched around the leg, and the attachments 122 are laid onto the cotton plush material such that their hooks engage the material. In the stretched condition, the hooks open up slightly and engage the cotton plush material very firmly.

It is most important that the compression bandage 110 applies the correct pressure all along the leg from the top of the calf to the foot. The preferred pressure decreases gradually from about 35 to 40mmHg at the ankle to about 17 mmHg at the top of the calf. Rectangles 136 provided on the attachments 122 become square when the correct pressure is achieved. Such rectangles may be provided on all the attachments to ensure that the correct pressure is applied along the entire leg. It may be seen that the rectangles 136 of Fig. 8 become square in Fig. 6, when the correct pressure is applied by the bandage to the leg.

Because the attachments 122 are provided essentially along the whole length of the compression bandage 110, gradually varying pressure is exerted along the patient's leg. No lines of high or low pressure are established if the bandage is used correctly.

It will be appreciated that in certain circumstances the absorbent bandage could be used in situations other than for the treatment of venous leg ulcers. In such cases, the use of the compression bandage would not be required. Further if the absorbent bandage is used to treat wounds other than on the leg, its configuration would be different.

Various modifications may be made to the above invention while still falling within its scope. The body of the compression bandage 12 need not be manufactured from neoprene but may be made from any suitable stretchy material, for example material incorporating rubber or elastane. The attachments need not incorporate hook or hook and fleece fastenings but may include tapes, cords or other similar materials attached together by hooks, loops, buckles or similar devices. The rectangle 136 may be replaced with any means for indicating the extent to which the body has stretched. For example, any shape may be printed onto the body. A plurality of such shapes may be used, for example, one adjacent to each projection to ensure an even pressure is exerted throughout the entire bandage. The bandage may be designed to be used at a single optimum pressure or it may be provided with different indications to provide different pressures depending on the circumstances. For example three adjacent rectangles could become square at respectively different pressures.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims

1. A bandage comprising a first absorbent layer for arrangement adjacent the skin of a patient, and a second absorbent layer on the first absorbent layer, the second absorbent layer having a greater propensity for absorption of fluids than the first absorbent layer, whereby when the bandage is arranged over a wound of a patient, the first absorbent layer can absorb fluid from the wound and the second absorbent layer can absorb said fluid from the first absorbent layer.

2. A bandage according to claim 1 further including a third layer on the second absorbent layer on the opposite side thereof to the first absorbent layer.

3. A bandage according to claim 2 wherein the third layer is an absorbent layer and has a lower propensity for absorption than the second layer.

4. A bandage according to claim 2 or claim 3 wherein the third layer is permeable to vapour, thereby allowing the skin to breathe.

5. A bandage according to any of claims 2 to 4 wherein the third layer has substantially the same absorbency as, or less absorbency than, the first absorbent layer.

6. A bandage according to claim 5 wherein the third layer is formed of the same material as the first absorbent layer.

7. A bandage according to any of claims 2, 3 or 4 wherein the third layer is substantially impermeable to liquid but permeable to vapour.

8. A bandage according to any preceding claim wherein the bandage is shaped to conform substantially to a lower leg of the patient.

9. A bandage according to claim 8 wherein the bandage is shaped to conform to the lower leg and foot of the patient.

10. A bandage according to claim 9 including a first part shaped to conform to the lower leg of the patient and a second part shaped to conform to the foot of the patient.

11. A bandage according to claim 10 wherein the bandage has stitching along the region thereof conforming to the calf region of the leg, and stitching along the region conforming to the heel region of the foot.

12. A bandage according to claim 11 further including stitching in a region conforming to the toe region of the foot.

13. A bandage according to any preceding claim wherein the bandage has opposite side edges wherein the side edges can be overlapped to a desired degree to fit the bandage to the patient's limb.

14. A bandage according to claim 13 wherein securing means are provided to secure the edge regions together.

15. A bandage according to claim 14 wherein the securing means is in the form of an adhesive tape.

16. A bandage according to claim 14 or claim 15 wherein suitable tabs and/or flaps are provided to ensure appropriate overlap.

17. A bandage according to any preceding claim wherein the first absorbent layer includes a polyester viscose material.

18. A bandage according to any preceding claim wherein the second absorbent layer includes a polyester felt, suitably an hydrophilic polyester felt.

19. A bandage according to any preceding claim wherein the second absorbent layer includes cotton wool.

20. A bandage according to any preceding claim wherein the third layer

comprises a polyester viscose material.

21. A bandage system comprising a first bandage according to any preceding claim and a second bandage being a compression bandage, the second bandage comprising a sheet of elastic material and means for releasably maintaining the sheet of elastic material in a stretched condition around a patient's limb.

22. A bandage system according to claim 21 wherein the second bandage is formed from a rubber or rubber-like material.

23. A bandage system according to claim 22 wherein the second bandage is formed from a synthetic rubber, for example neoprene.

24. A bandage system according to claim 22 or claim 23 wherein the means for maintaining the material around the patient's limb includes an outer attachment associated with a side edge region of the sheet, the outer attachment comprising a plurality of tabs provided along substantially the length of said side edge.

25. A bandage system according to claim 24 wherein the tabs are so provided along the length of said side edge that there are substantially no gaps between adjacent tabs when the bandage is correctly applied to a patient's limb.

26. A bandage system according to claim 24 or claim 25 wherein one part of a hook and fleece fastening means is provided on an inner face of each tab and the other of said hook and fleece fastenings is provided on the sheet.

27. A bandage system according to claim 26 wherein each tab is stretchable, whereby when the second bandage is applied to the limb of a patient, the degree of stretch of the sheet material and of the tabs determines the pressure applied to the limb at the respective tab.

28. A bandage system according to any of claims 21 to 27 wherein the second bandage includes visual indication means to indicate whether the

correct pressure is applied to the limb by the bandage.

29. A bandage system according to claim 28 wherein the visual indication means comprises a shape applied to at least some of the tabs to indicate that the correct pressure is applied when the shape alters in a recognisable way.

30. A bandage substantially as herein described with reference to the drawings.

31. A bandage system substantially as herein described with reference to the drawings.

32. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.

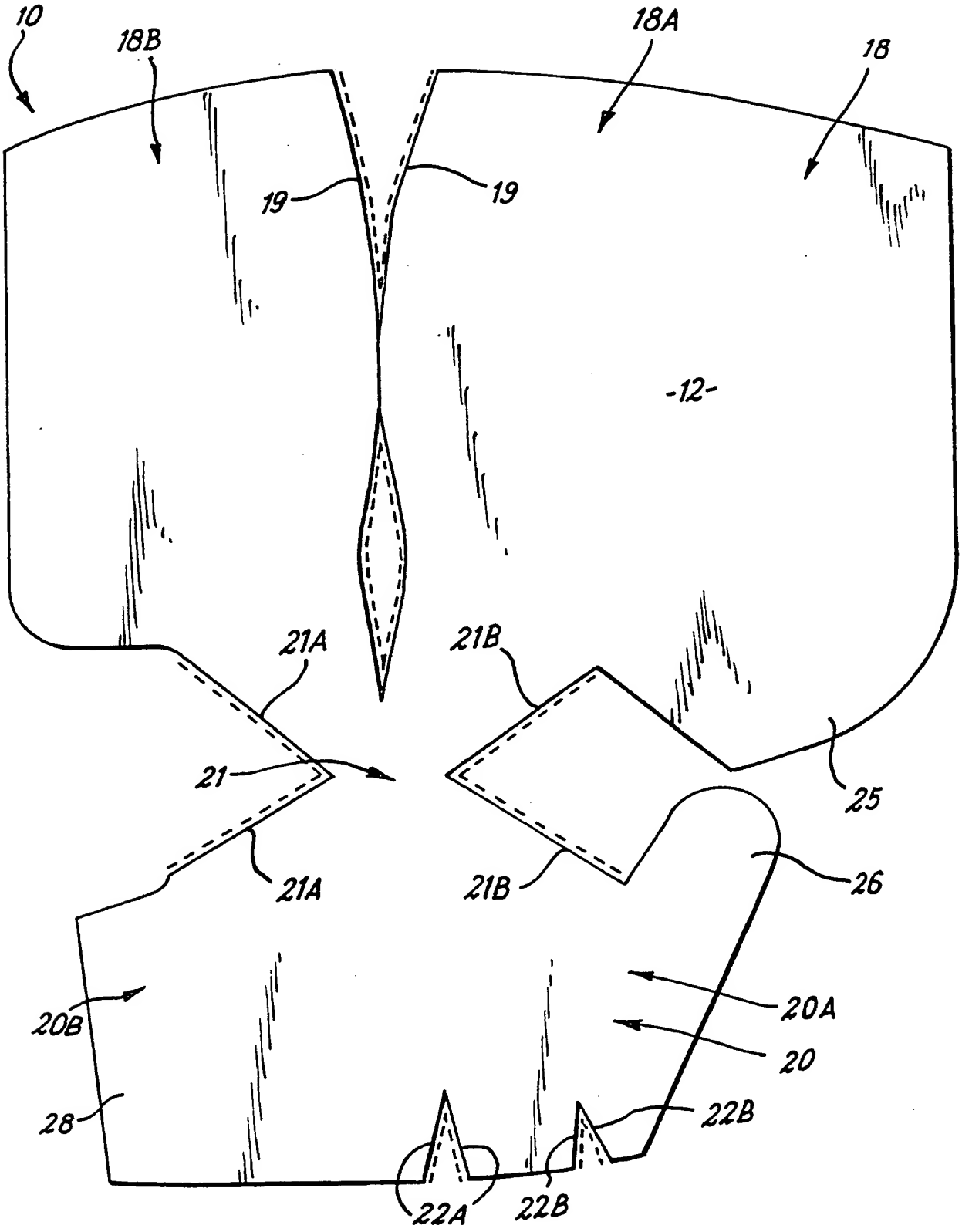
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FIG. 1

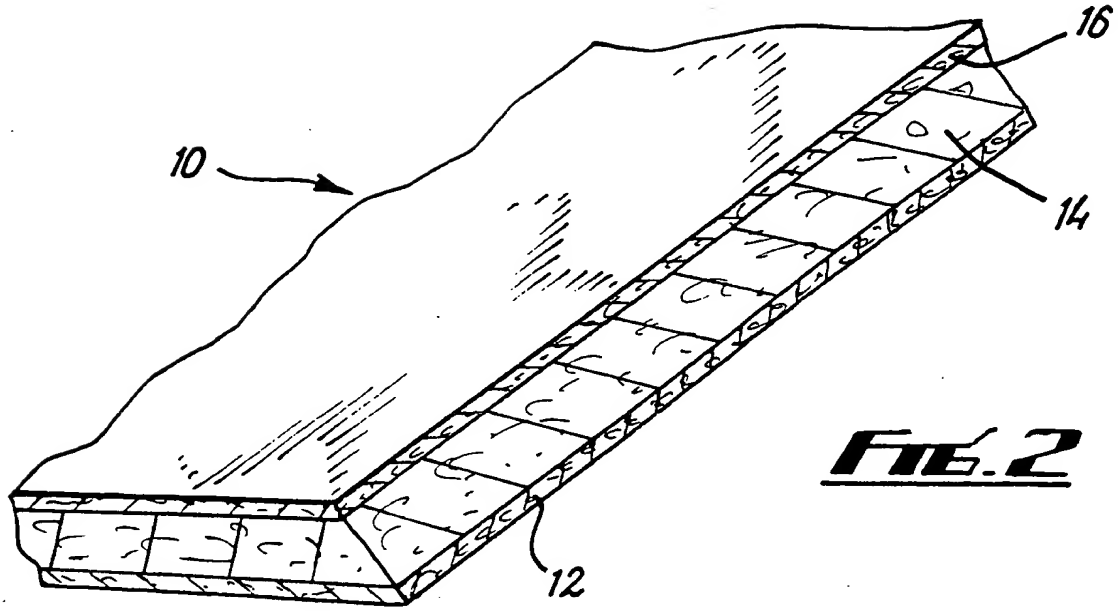


FIG. 2

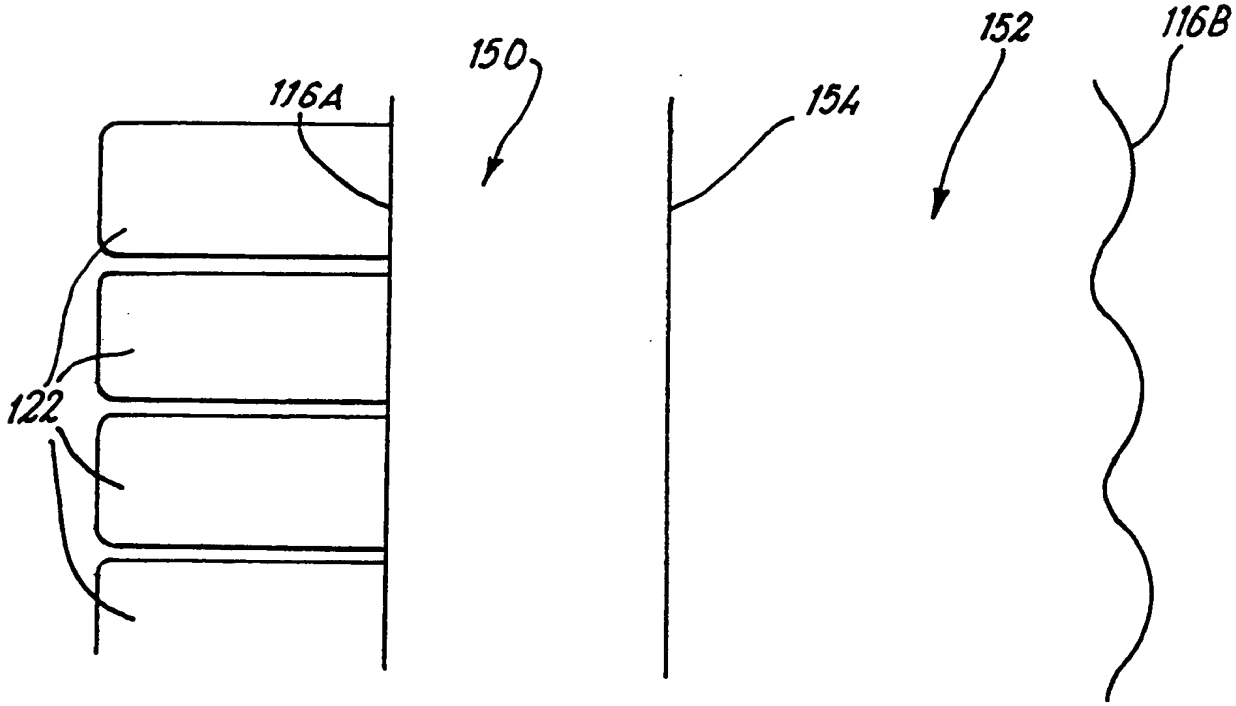


FIG. 6

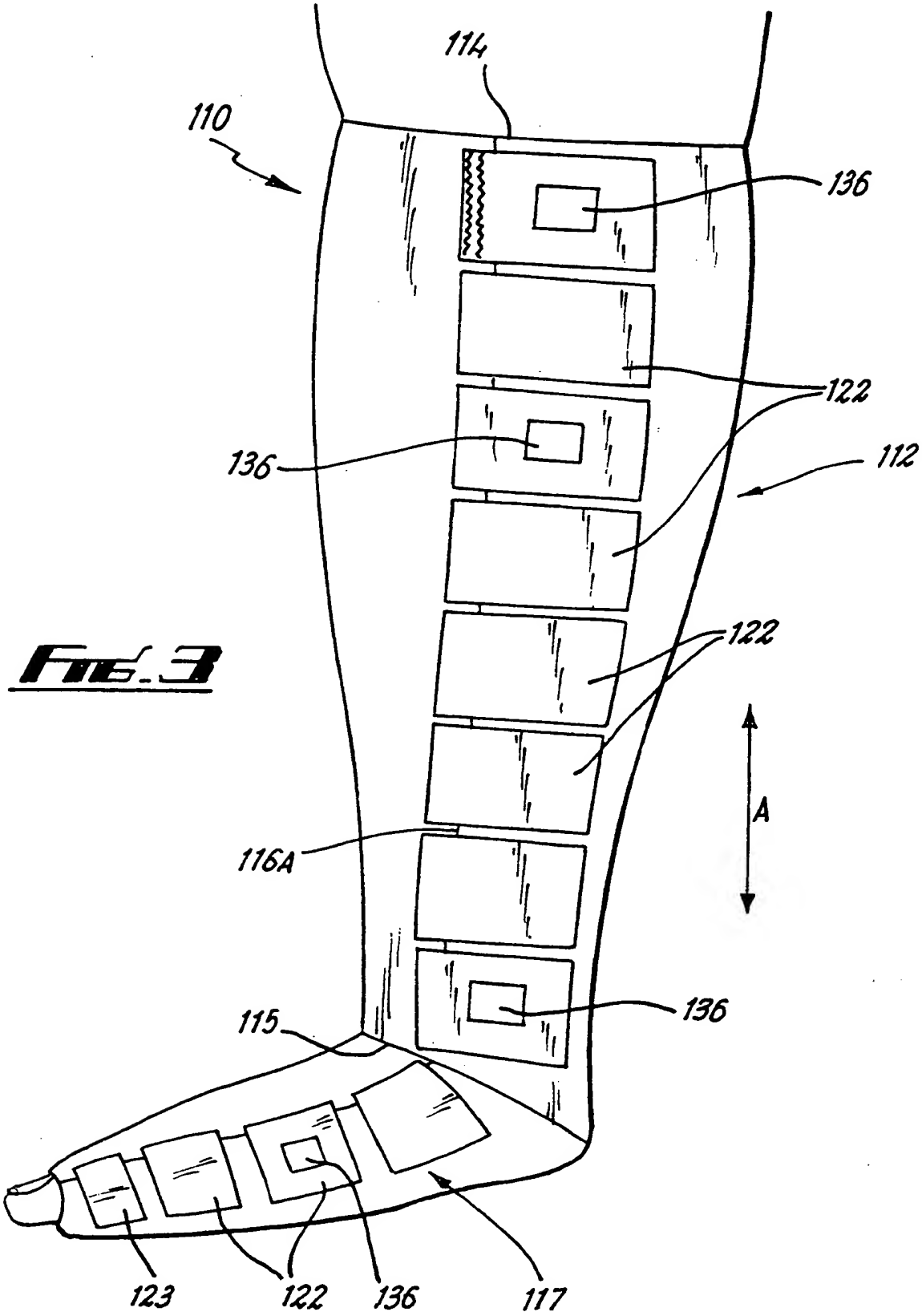


FIG. 3

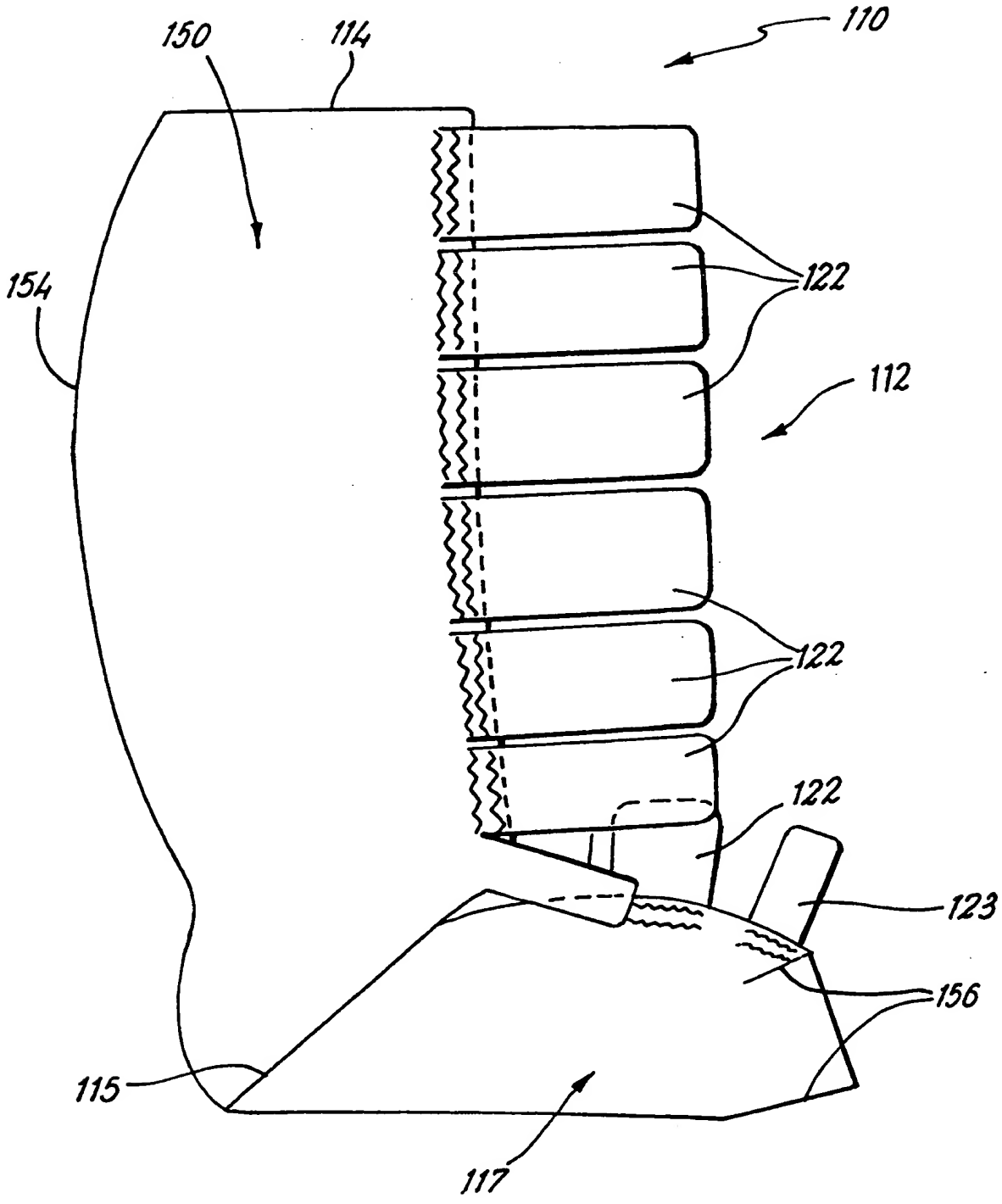


FIG. 4

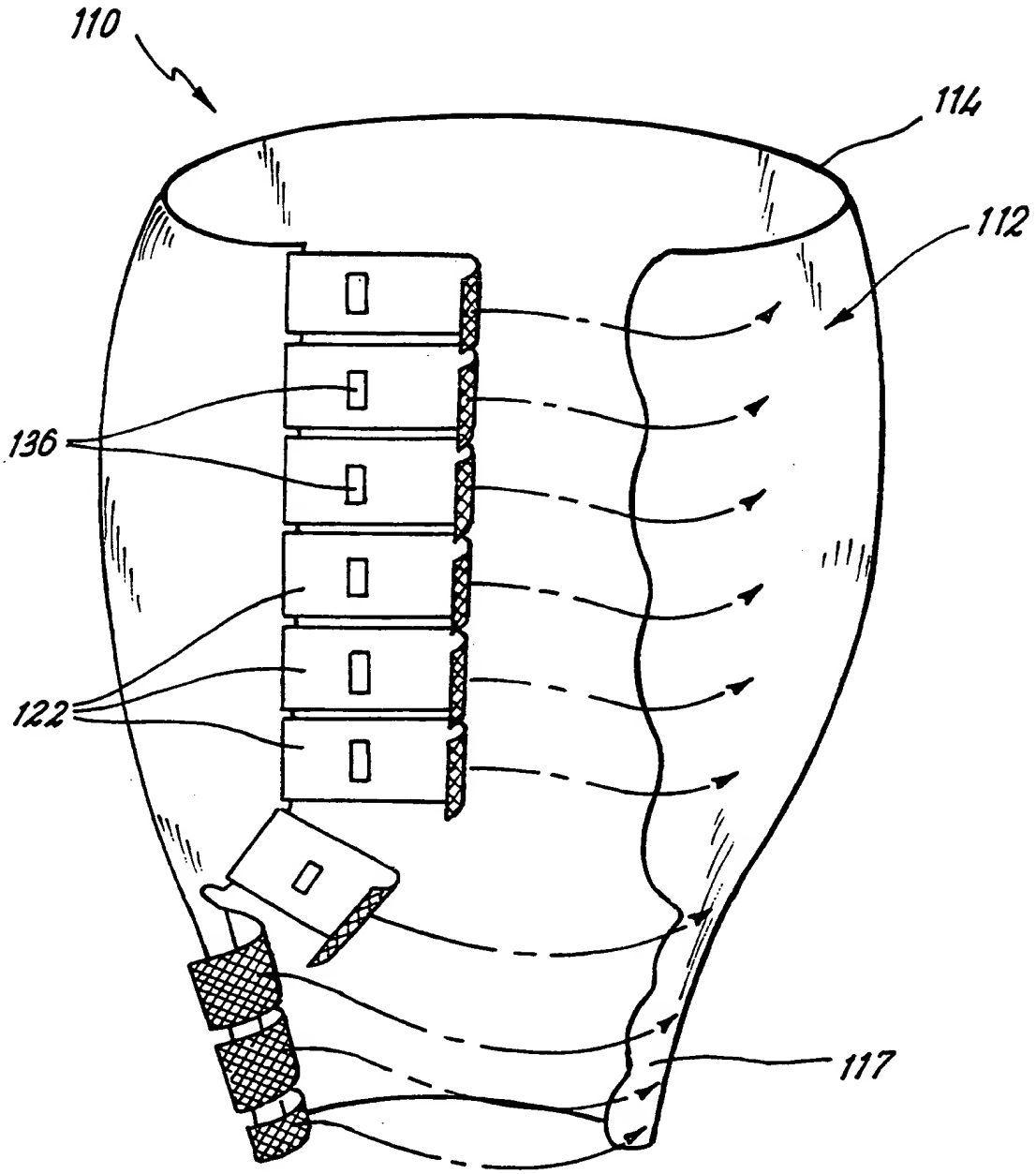
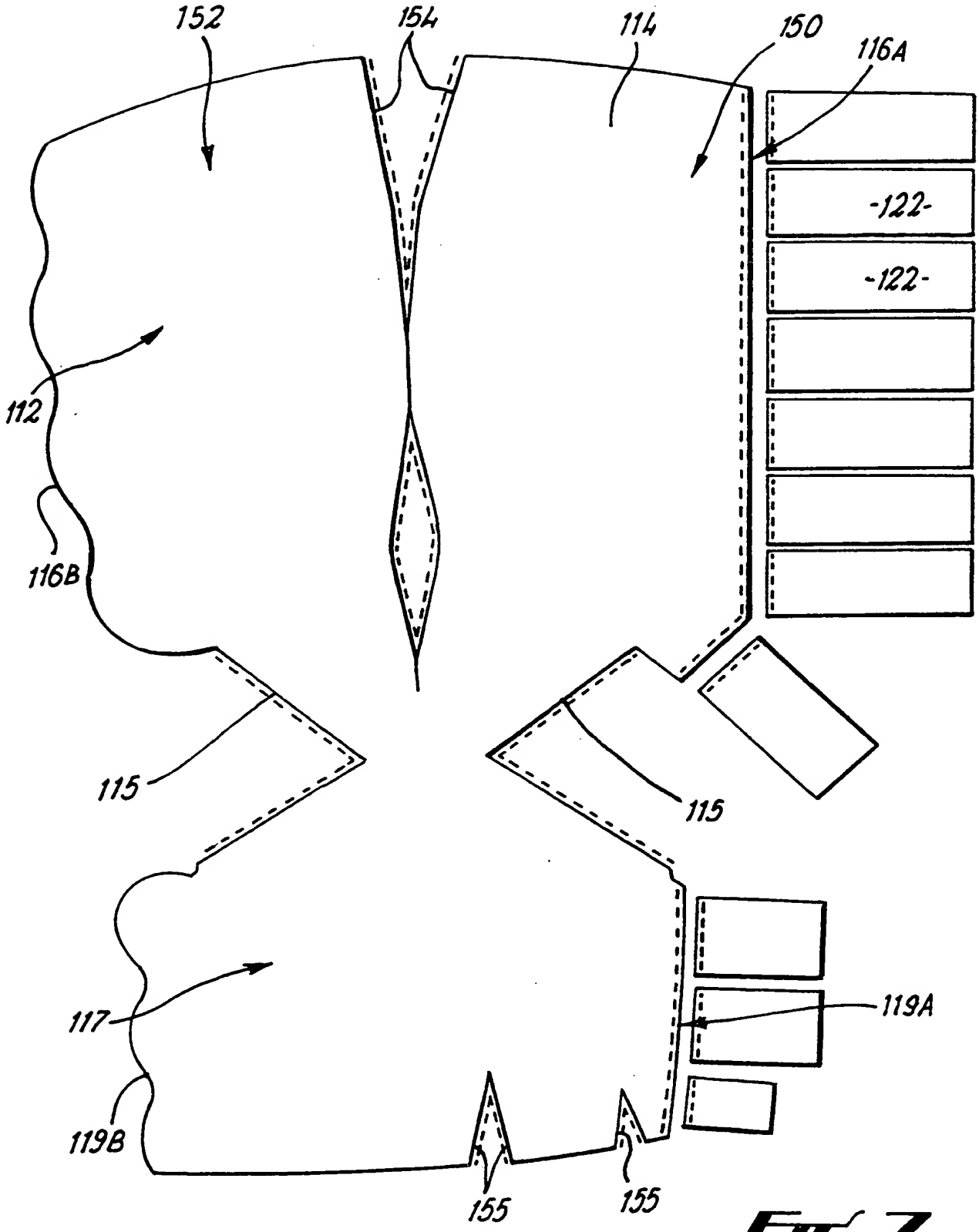


FIG_5


152
154
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150
116A
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-122-
112
116B
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115
117
119A
119B
155
155

FIG. 7

INTERNATIONAL SEARCH REPORT

Int. ..tional Application No
PCT/GB 00/00149

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 4 360 015 A (MAYER NATHAN) 23 November 1982 (1982-11-23) column 1, line 5 - line 8 column 3, line 37 -column 4, line 47; figure 1 ---	1-10,13, 17-20
X	EP 0 478 011 A (KIMBERLY CLARK CO) 1 April 1992 (1992-04-01) page 4, line 53 -page 5, line 57; figures 1-6 --- -/--	1-10,13, 17-20

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 May 2000	23/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Louter, P

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 00/00149

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	EP 0 597 749 A (PRATICIEN LAB DU) 18 May 1994 (1994-05-18) abstract; figures 1-5	21,27-29
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